

## Academic Leadership: The Online Journal

---

Volume 8

Issue 2 *Spring 2010*

Article 6

---

4-1-2010

# Analysis Of The Educational Facilities In Southern Universities In Nigeria

O.L. Oyeniya

Follow this and additional works at: <https://scholars.fhsu.edu/alj>



Part of the [Educational Leadership Commons](#), [Higher Education Commons](#), and the [Teacher Education and Professional Development Commons](#)

---

### Recommended Citation

Oyeniya, O.L. (2010) "Analysis Of The Educational Facilities In Southern Universities In Nigeria," *Academic Leadership: The Online Journal*: Vol. 8 : Iss. 2 , Article 6.

Available at: <https://scholars.fhsu.edu/alj/vol8/iss2/6>

This Article is brought to you for free and open access by FHSU Scholars Repository. It has been accepted for inclusion in Academic Leadership: The Online Journal by an authorized editor of FHSU Scholars Repository.

---

# Academic Leadership Journal

## Introduction

The educational system in Nigeria has witnessed tremendous expansion within the last two decades in the midst of limited resources and dilapidated educational facilities. The education sector has not enjoyed a fair share of the total recurrent and capital expenditure of the federal Government, despite the 26% recommended by the United Nations Educational Scientific and Cultural Organization (UNESCO). The high priority accorded education according to Longe (1985), has partly been due to the view of education as an investment.

The national goal of developing the educational system in such a way as to provide a satisfactory flow of men and women capable, of acquiring the skills necessary to exploit to the fullest, the natural resources of the country makes it imperative for facilities to be abundantly available in universities. Buildings are needed to shelter staff and students, laboratory facilities are needed to generate manipulative skills in students, sports/games facilities are needed to develop the mental, social and physical aspects of the students.

Educational facilities could be considered as the entire scope of physical infrastructures provided in the school for the purpose of administration, teaching and learning processes. Odor (1995) described educational facilities as physical resources which the school administrator and his reference group harness, allocate, utilize and maintain for the purposes of effective school administration, teaching and learning process.

Mmou (2000) quoted Olutola (1991) as defining educational facilities as the site building as well as items such as machines, laboratory equipment, the black boards and the learner's tools. Enaohwo (1989) stated that instructional facilities are earlier identified with direct teaching functions. He said they serve essentially as centers for learning and teaching in the school set up. Classrooms, laboratories, workshops and teaching studios are directly relevant. Equally important are botanical and geographical gadget, museum and zoological gardens, which are essential for practical illustration of relevant issues and concepts acquired from the classrooms.

Campbell (1966) stated that school facilities exist to facilitate instructions and their inadequacies usually have adverse effects on teaching/learning process. According to Ogbodo (1995), educational facilities are those materials that facilitate teaching and learning processes in the school. The school like any other productive system requires raw materials and to succeed in its transformation process. Castaldi (1977) posits that educational facilities are those things of education which enable a skillful teacher to achieve a level of instructional effectiveness that far exceeds what is possible when they are not provided. By nature, educational facilities have been positively linked with students' academic performance (Bloom 1978) and educational efficiency (Zymelamn, 1973, Coombs & Hallak, 1987; Mingat & Tan 1988; Osahon (1994).

The specifications of educational facilities are usually worked out by planning experts and kept in

Ministries of Education, National Universities Commission (NUC) or written into law (Aghenta, 1993) to insert NUC minimum academic standard for instance.

- i. Students population: 10,000 per University per session
- ii. Books in a fully developed Library to contain 500,000 volumes of books i.e. 50 books per students
- iii. Classroom/Lecture theatre/halls.

In the last fifteen years, Nigerians have been dissatisfied with the output from her universities. This conclusion emerged from the 2004 National University commission (NUC) NEEDS assessments study on the labour market expectations of graduates from the Nigerian Universities.

### Statement of Problem

One of the cardinal aims of university education is to provide skilled, high level manpower, which is vital to economic and national development. More than anything else, educational facilities are very necessary for utmost realisation of the goals of education. In this era of accelerating technological development, modern instructional facilities are not only important; they are expected to be available in a reasonable state. The necessary resources to bring about the production of skilled university graduates will not be achieved without fundamental re-examination of the available educational facilities for a university education. Regrettably, the emphasis on more university places constitutes an initiative, which is superficial and fails to examine those actual problems, which are seriously inhibiting the task of universities.

The need to match a growing student's enrolment with corresponding increase in the provision of basic learning facilities cannot be underestimated. However, it is worrisome to note that Nigerian universities are fast decaying, as the resources required for the educational production process appear to be in short supply.

In the light of the above, this study attempts to analyse the state of educational facilities in Nigerian universities taking cognizance of classroom/lecture theatres, volumes of books in the library, laboratories in relation to science students' population and computers in universities.

### Research Questions

The investigations into the research problem would be guided with the following research questions;

- i. Are the basic educational facilities available in Nigerian Universities adequate?
- ii. Does the state of the educational facilities available in Nigerian Universities differ according to the generation?
- iii. Does the state of the educational facilities available in Nigerian Universities differ according to specialisation? (Conventional and non-conventional)
- iv. Does the state of the educational facilities available in Nigerian Universities differ according to ownership?

## Hypotheses

- 1 The difference between the observed and the expected basic educational facilities are not significant among Nigerian universities.
- 2 Generation does not significantly influence availability of facilities in Nigerian universities.
- 3 Available facilities in convectional universities are not significantly different from non-convectional universities in Nigeria.
- 4 Ownership does not significantly influence the educational facilities available in Nigerian universities.

## Purpose of the study

The purpose of this study generally is to determine the state of educational facilities in Nigerian Universities. Specifically, the study is intended to achieve the followings:

1. Determining the state of educational facilities available;
2. Investigating the influence of generation of universities on the state of educational facilities;
3. Examining the difference between state of facilities in conventional and non-conventional universities and
4. Determining the influence of ownership on the state of educational facilities in universities.

## Research Method

The study is a descriptive research aimed at surveying the availability and the adequacy of some educational facilities that are related to instruction in Nigerian universities. The universities were selected using stratified random sampling technique. The universities were first stratified according to generation, ownership and specialisation. Thereafter, the random sampling technique was used to sample the four universities used for the study

Table 1: Sampled Universities stratified according to Generation and Specialization

S/No	University	Generation and Specialisation
1.	UNIBEN	1 <sup>st</sup> Generation and Conventional
2.	UNIPORT	2 <sup>nd</sup> Generation and Conventional
3.	RUST	3 <sup>rd</sup> Generation (State) and Specialised
4.	DELSU	3 <sup>rd</sup> Generation (State) and Conventional

## Research Instrument

Two specific instruments were used in this study. They were:

- i. An observation check list
- ii. Instructional based enrolment figures

A checklist in form of data proformat was utilised in generating data on educational facilities in Nigerian Universities. The checklist titled Educational Facilities in Nigeria Universities (EFINU) was designed and developed by the researcher. The checklist was made up of two sections;

Section A of EFINU focused on general institutional data. Information sought included total number of classes by faculty and total enrolment..

Section B solicited information on classrooms/lecture theatre, laboratory for physics, chemistry, and biology, technology workshops/studios, engineering workshop, and volumes of books in the library available for effective learning and teaching in the university.

In using the checklist, the researcher ranked the availability and the state of what is available noting that;

NA – Not available – 0

NA – Not adequate – - 1

A – Adequate – - 2

FA – Fairly Adequate – 3

VA – Very adequate – 4

## Methods of data collection

The essential data and information collected in this study were through the academic planning office where details of students' population were documented. Information on the facilities studied such as classrooms/lecture theatres/halls, laboratories, volumes of books in the library, and computers were check listed.

## Method of Data Analysis

Simple percentages, tables and chi-square test of significance of the existing facilities from the actual requirement of the universities based on NUC standard were used in data analysis. Consequently, the analyses were organized into four research questions and four hypotheses.

## Research Question One:

Are the basic educational facilities available in Nigeria universities adequate?

In answering the above question, the educational facilities available in Nigerian universities were checked through observation in the four universities sampled for investigation. The facilities observed were classrooms/lecture theaters/halls, volumes of books in the libraries, laboratories and computer facilities. The observed facilities were compared with the expected as specified by NUC. Detailed results are presented in table 2.

Table 2: Level of Adequacy of Facilities in Nigerian Universities.

universities	Facilities	Classroom	Volumes of book in Library	Adequacy of computers	Adequacy of laboratories
UNIBEN (A)	Observed	146	721	150	10761
	Expected	289	500,000	2,890	3340
	% Adequacy	50.52	0.144	5.19	322.19
	Chi-square cal.	175.53	1996649.95	8344.29	49254.52
	Chi-square crit.	7.81	7.81	7.81	70.81
	Standard deviation	25.68	301.02	167.58	987.90
UNIPORT (B)	Observed	154	634	250	9798
	Expected	239	500,000	2387	3340
	% Adequacy	64.44	0.127	10.47	293.4
	Chi-square cal.	175.53	1996649.95	8344.29	49254.52
	Chi-square	7.81	7.81	7.81	70.81

	cirt.				
	Standard deviation	25.68	301.02	167.58	987.90
RUST (C)	Observed	130	180	40	8370
	Expected	206	500,000	2051	3340
	% Adequacy	63.11	0.036	1.95	250.59
	Chi-square cal.	175.53	1996649.95	8344.29	49254.52
	Chi-square cirt.	7.81	7.81	7.81	70.81
	Standard deviation	25.68	301.02	167.58	987.90
	Observed	96	141	20	9854
	Expected	190	500,000	1909	3340
DELSU (D)	% Adequacy	50.53	0.036	1.05	295.0
	Chi-square cal.	175.53	1996649.95	8344.29	49254.52
	Chi-square cirt.	7.81	7.81	7.81	70.81
	Standard deviation	25.68	301.02	167.58	987.90

Source: Fieldwork 2007/2008 NUC 1: 10,000

The result represented in table 2 indicated that for all facilities studied in Nigerian universities, the observed were less than the expected in terms of adequacy. For instance, the adequacy level of the

following facilities in UNIBEN (classroom 50.52%, volumes of books in library 0.144%, computers 5.19% and laboratories 322.19%) other universities studied are reported in the table.

The information above indicated very clearly that educational facilities available in Nigerian universities are highly inadequate. Facilities in the laboratories were three times overutilized.

### Hypothesis One

The deference between the observed and expected basic educational facilities is not significant among Nigerian universities.

Statistically, the observed level of adequacy of all the facilities is empirically considered significantly different since the calculated chi-square of 175.53 is greater than chi-square critical of 7.81 at 0.05 level of significance. This implies that there is a significant difference between the available facilities in Nigerian universities and what is expected.

### Research Question Two

Does the state of educational facilities available in Nigerian universities differ according to their generation?

In answering this question, the observed level of adequacy of four(4) educational facilities in the four(4) universities calibrated as 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generations respectively were investigated. The facilities were classrooms/lecture theatres/halls, volumes of books in the library, adequacy of computers and laboratories. The observed facilities were compared with the expected as specified by the NUC. Detailed results are represented in table 3.

Table 3: Level of Adequacy of Facilities in Nigerian Universities according to Generation of the Universities

	Facilities	Classroom	Volumes of book in LIBRARY	Adequacy of computers	Adequacy of laboratories
1 <sup>st</sup> Generation	Observed	146	721	150	10761
	Expected	289	500,000	2,890	3,340
	% Adequacy	50.5	0.14	5.19	
	Chi-square cal.	173.97	1996650	8352	48924.84

Source:



		Chi-square cirt.	5.99	5.99	5.99	5.99
		Standard deviation	56.71	221.38	86.55	2691.58
2 <sup>nd</sup> Generation	Observed		154	634	250	9798
	Expected		239	500,000	2,387	3340
	% Adequacy		64.4	0.13	10.47	
	Chi-square cal.		173.97	1996650	8352	48924.84
	Chi-square cirt.		5.99	5.99	5.99	5.99
	Standard deviation		56.71	221.38	86.55	2691.58
3 <sup>rd</sup> Generation	Observed		226	321	60	18224
	Expected		396	1,000,000	3,960	6680
	% Adequacy		57.1	0.03	1.52	
	Chi-square cal.		173.97	1996650	8352	48924.84
	Chi-square cirt.		5.99	5.99	5.99	5.99
	Standard		56.71	221.38	86.55	2691.58

	deviation				
--	-----------	--	--	--	--

Fieldwork 2007/2008 NUC 1: 10,000

The result presented in table three showed the deficiencies in the observed level of adequacy between the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generation universities. For example, 1<sup>st</sup> generation universities have classrooms 50.5%, 2<sup>nd</sup> generation have 64.4% and 3<sup>rd</sup> generation have 57.1%. Other facilities studied are indicated in the table. The information above indicated that the educational facilities were between 50.5% and 64.4% which are not adequate.

### Hypothesis Two

Generation does not significantly influence availability of facilities in Nigerian universities.

The illustration in table 3 showed clearly the deficiency in the observed level of adequacy between 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generation universities. With the calculated chi-square of 173.97 and the chi-square critical of 5.99 showed that there was a clear indication that the level of adequacy of the facilities do not differ significantly on the bases of generation.

### Research Question Three

Does the state of the educational facilities available in Nigerian Universities differ according to specialization? (I.e conventional and non-conventional).

In answering this question, the observed level of adequacy and expected level of adequacy of four (4) educational facilities in four (4) universities according to specialization i.e. conventional and non-conventional were investigated and analyzed.

Table 4: Level of Adequacy of Facilities in Nigerian Universities according to Specialization.

Universities	Facilities	Classroom	Volumes of book in library	Adequacy of computers	Adequacy of laboratories
Conventional	Observed	396	1496	420	28,985
	Expected	718	1,500,000	7,186	10,020
	% Adequacy	55.15	0.10	5.84	28.79
	Chi-square cal.	172.45	1996649.56	8342.33	48,382.09

	Chi-square cirt.	3.84	3.84		3.84
	Standard deviation	152.71	658.00	268.70	13,567.26
Non- Conventional	Observed	130	180	40	9,798
	Expected	206	500,000	2051	3,340
	% Adequacy	63.11	0.04	1.95	293.35
	Chi-square cal.	172.45	1996649.56		48,382.09
	Chi-square cirt.	3.84	3.84	3.84	3.84
	Standard deviation	152.71	658.00		13,567.26

Source: Fieldwork 2007/2008 NUC 1: 10,000

The result presented in table 4 showed that the observed level of adequacy of educational facilities in conventional and non-conventional universities were lower than the expected. For example, level of adequacy of classrooms for conventional is 55.15% while that of non-conventional is 63.11%. Other facilities studied are indicated in the table.

### Hypothesis Three

Available facilities in convectional universities are not significantly different from non-convectional universities in Nigeria.

The chi-square calculated value of 172.45 is greater than chi-square critical value of 3.84, which implies that there is no significant difference between the levels of adequacy in Nigerian universities according to specialization.

### Research Question Four

Does the state of the educational facilities available in Nigerian Universities differ according to ownership?

In answering this research question the level of adequacy of some essential educational facilities in

four (4) universities were compared taking cognizance of what is on ground in these universities (observed) in relation to what is expected as provided for by the NU

Table 5: Level of Adequacy of Facilities in Nigerian Universities According to Ownership.

Universities	Facilities	Classroom	Volumes of book in library	Adequacy of computers	Adequacy of laboratories
Federal Government	Observed	300	1355	400	20559
	Expected	528	1,000,000	5,277	6680
	% Adequacy	56.82	0.14	7.58	
	Chi-square cal.	171.43	1996649.94	8348.23	48786.01
	Chi-square crit.	3.84	3.84	3.84	3.84
	Standard deviation	111.54	543.35	167.58	1167.50
State Government	Observed	226	321	60	18224
	Expected	396	1,000,000	3960	6680
	% Adequacy	57.07	0.03	1052	
	Chi-square cal.	171.43	1996649.94	8348.23	48786.01
	Chi-square crit.	3.84	3.84	3.84	3.84
	Standard deviation	111.54	543.35	167.58	1167.50

Source: Fieldwork 2007/2008 NUC 1: 10,000

The result presented in table 5 above showed that the observed level of adequacy in both State and Federal government universities were less than the expected. For example the level of classroom adequacy for federal government is 56.82% while that of state government is 57.70%. Other facilities studied are indicated in the table.

#### Hypothesis Four

Ownership does not significantly influence the educational facilities available in Nigerian universities.

The chi-square calculated value of 171.43 is greater than chi-square critical value of 3.84 which implies that there is no significant difference between the levels of adequacy of facilities in Nigerian universities according to ownership.

#### Research Findings

From the results presented in the tables above, the following are outlined as the major findings in the study:

- 1 There is a general shortfall of educational facilities in Nigerian universities in the area of classroom/lecture theatres, volumes of books in the library, laboratories/studios/workshops as well as computer hard and soft wares.
- 2 The state of educational facilities in Nigerian universities does not differ significantly on the basis of generation in which the universities were founded.
- 3 The poor state of educational facilities in Nigerian universities do not differ significantly on the basis of specialization and
- 4 Ownership of universities in Nigeria does not significantly determine the level of adequacy of educational facilities in the universities.

#### Discussion of Findings

The basic educational facilities available in Nigerian Universities that formed the variables of the study are classrooms/lecture theatre, volumes of books available in the libraries, laboratories/studio/workshop and computers. The first Research Question sought to find out if the basic educational facilities available in the Nigerian universities are adequate. The study revealed that the basic educational facilities in all the universities sampled are grossly inadequate. This supports the views of Nwadiani (1999), which stated that lecture halls, classrooms, office and students' residential accommodation are seriously inadequate. It also supports Ajeyalemi (1987) who observed that large student/teacher ratio is one of the problems of science education at tertiary level in Nigeria. Oguntoye (1987) observed that at the tertiary level, books and equipment with high foreign exchange content are in short supplies in Nigeria.

Research Question two sought to find out if the states of educational facilities in Nigerian universities differ according to the generation. Generation of universities did not influence the level of adequacies

of educational facilities in Nigerian universities; hence, there is no significant differences in the level of adequacies of basic educational facilities in first, second and third generation of Nigerian universities. This finding is attested to by Ukoli (1995), Duze (1997) who stated that teaching and research facilities had never really taking root in any new university in Nigeria and that whatever used to be in the older universities no longer existed, thus bringing both old and new universities down to the same footing.

Research question three sought to find out if the states of the educational facilities in Nigerian Universities differ according to specialization (i.e. conventional and non-conventional). The study revealed that there is significant difference in the state of educational facilities in favour of conventional universities. Ellen (1974) stated that lack of building especially where specialized courses are run creates a lot of handicap to effective schoolwork and development. As a result of lack of the required specialised buildings and equipment in the non-conventional universities, admissions into management based disciplines, educations and law continue to soar at the expense of the core basic sciences, agriculture, engineering and technology disciplines.

Another fundamental implication of the finding is that the prevailing circumstances where laboratories are grossly deficient; lecturers are compelled to introduce a new teaching approach known as "TOP" "Theory of Practicals" or generally referred to as alternative to practicals. This in no doubt has devastating implications on Nigeria's quest for science and technological break through.

The fourth Research Question sought to find out if the states of the educational facilities available in Nigerian Universities differ according to ownership (i.e. Federal and State Governments). The findings indicated that the ownership of Universities did not influence the state of the educational facilities in Nigerian Universities. The Federal Universities enrolled larger numbers of students in relation to the available basic facilities than state Universities thereby, creating no significant difference in the state of educational facilities available in Nigerian Universities according to ownerships. As observed by Utulu (2001); Nwadiani and Akpotu (2002), Ukeje (2002), the budget allocation to education at both Federal and State level is poor and erratic. In the same vain, Alabi (2005) remarked that poor funding has been a major set back to the development of university education in Nigeria, State and Federal universities alike.

## Conclusions

On the basis of the findings made, the following conclusions have been drawn:

The general shortfall of educational facilities in Nigerian universities in the area of classrooms/lecture theatres, laboratories, libraries, volumes of books in the libraries as well as computer hard and software were not uniform and did not conform to NUC approved standards.

The classrooms /lecture theatres were crowded; most of them were accommodating twice or three times the number of students they were built for. Laboratories/studio floor spaces were inadequate in all the universities.

The study revealed that lack of building especially where specialised courses are run created a lot of handicap to effective teaching and learning in Nigerian universities.

Enrolment has increased in leaps and bounds in the universities and quality education remains a

problem. There is the likelihood that the quality of Nigerian graduates, particularly in the Sciences and Technology based disciplines will continue to deplete with grave consequences for employment, productivity, economic growth and development.

## Recommendations

On the basis of the findings and consequent conclusions, the following recommendations were made:

1. More classrooms/lecture theatres should be built in Nigerian universities. This would solve the problem of over-crowded classrooms, laboratories and examination halls.
2. Admission of students should be based strictly on the facilities available in the universities for effective teaching, learning and research.
3. The Federal and state governments should endeavor to build and equip science laboratories and workshops/studio in the conventional and specialised universities so as to create enough and large working space per student.

If the above recommendations are properly implemented, it could solve the problem of inadequacy in educational facilities in Nigerian universities.

## REFERENCES

- Aghenta, J. (1993): "Principles and Practices of Educational Planning" Focus on the Developing country published by Nigerian society for Educational Planning (NSEP) University of Benin- Benin City, Nigeria.
- Ajeyalemi, Duro and Ejiogu, Aloy (1987): "Issues, Problems and Prospects in Nigerian Education" In Ejiogu, Aloy and Ajeyalemi, Duro (Eds) Emergent Issues in Nigerian Education. Lagos, Joja Educational Research and Publishers Ltd. Vol 1, pp1-
- Alabi, A. (2005) Deregulation of the Nigerian University Education: Issues and Challenges pp. 52-56 in deregulating the provision and Management of Education in Nigeria
- Bloom B et al (1978): Environments for Learning in Britain (NFER Publishing) Company Ltd.
- Campbell, P. (1966): A study of Building Planning and Construction in Teachers College in Ondo state Nigeria. Journal of Teacher Education; Vol. 1, No. 1, February 1985.
- Castaldi B (1977) Education Facilities Planning Remodelling and Management. Boston: Mass Allun and Bacon, Inc.
- Combs P. & Hallak, J (1987): Cost Analysis in Education, Washington IBRD The World Bank.
- Duze, Chinelo .o (1997): an identification and analysis of problems encountered by postgraduate students in Nigerian universities (unpublished Ph.D thesis).
- Ellen N. (1974): Planning and Educational Inequality Bevks: NFER Publishing Company Limited.

Enaohwo J and Eferakeya O.A (1989) Education Administration Ibadan Paper Back Publishers Limited.

Federal Republic of Nigeria (N.U.C.) Approved Minimum Academic standard In Engineering and Technology for All Nigerian Universities. October, 2002

Federal Republic of Nigeria (N.U.C.) Approved Minimum Academic standard In Science for All Nigeria Universities October, 2002

Federal Republic of Nigeria (NUC) Approved Minimum Academic Standard In, Architecture for All Nigerian Universities October, 2002

Longe R. (1985) "Factors Influencing Current Cost of Secondary Education in Oyo State of Nigeria" Unpublished Ph.D Thesis, University of Ibadan.

Mingat A & Tan, Jee-Peng (1988): Analytical Tools for Sector Works in Education. Baltimore: The Johns Hopkins University Press.

Mmou, R and Olutola, A (2000): supervision, utilization of Facilities in vocation Education, London: Macmillan Press limited.

Odor, G.O (1995) administration of schools in Nigeria Monose Amalgamates, Benin city.

Ogbodo C. (1995): "Managing Educational Facilities in school" in V.F Peretomode: (ed.) Introduction to Educational Administration Planning and Supervision .Ikeja: Jaja Educational Research and publishers Ltd.

Oguntoye A. (1987): "Financial Distress in the Nigerian Education System" in Ejiogu Aloy M and Ajeyalemi, Duro (ed.s) Emergent Issues in Nigerian Education Lagos: Joja Educational Research Association.Vol.4, No.1. pp 67-86

Olutola A.D (1991) "Educational Facilities and Students Performance in West African School Certificate Examination" International Journal of Education management. 1 (1) 17-24.

Osahon U. (1994) "Pre- vocational Resource Management and Utilization in Nigeria: A case study of public secondary schools in Benin City; A CED/NERA Conference paper.

Ukeje, B.O (2002): Financing Education in Nigeria. The Nigerian Social Scientist, 5, (1) 31-39.

Ukoli, F (1995) guest of the week, July 17 in C.O. Duze: an identification and analysis of problems encountered by postgraduate students in Nigerian universities. Unpublished Ph.D thesis, Delta State University, Abraka.

Utulu, C (2001) "Quality of University Education in Nigeria: Problems and Solutions" Journal of the Commonwealth Council for the Educational Administration and Management vol.29, no.1. pp 58-66.

Zymelman Manuel (1973): Financing and Efficiency in Education. Boston. The Nimrod Press.



